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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,253	07/07/2003	Cheng-Lung Lee	ACMP0087USA	1252

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(NAIPC) NORTH AMERICA INTERNATIONAL PATENT OFFICE
P.O. BOX 506
MERRIFIELD, VA 22116

EXAMINER	
DUDDING, ALFRED E	
ART UNIT	PAPER NUMBER
2853	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H1A

Office Action Summary	Application No.	Applicant(s)	
	10/604,253	LEE ET AL.	
	Examiner	Art Unit	
	Alfred E. Dudding	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-10 and 16-20* is/are allowed.

6)☒ Claim(s) *11-15 and 21-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/7/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

a. Abstract, line 10, change "anda' to - -and a--.

Appropriate correction is required.

Claim Objections

2. **a.** Claim 12 is objected to because of the following informalities: line 3, change "avoltage" to - -a voltage- -.

b. Claim 23 is objected to because of the following informalities: line 4, change "pulsesif" to - -pulses if- -.

c. Claim 24 is objected to because of the following informalities: line 2, change "pulsesif" to - -pulses if- -.

d. Claim 25 is objected to because of the following informalities: lines 2 and 4, change "pulsesif" to - -pulses if- -.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims **11** and **21** are rejected under 35 U.S.C. 102(b) as being anticipated by Widder et al. (U.S. 5,475,405 A).

Widder et al. disclose a printing apparatus, and a method of warming a printhead, Column 3, lines 30 – 32, comprising a printhead for ejecting ink from a plurality of nozzles, Figure 1, element 10 (printhead), element 11 (nozzles), the printhead comprising a substrate; and a plurality of heaters arranged on the substrate for heating ink in the printhead to generate bubbles in the ink and eject the ink through the corresponding nozzles, Column 3, lines 44 - 47; a signal generator for generating printing pulses, Figure 2, element 54, and non-printing pulses used to control the heaters, Figure 2, element 44, the printing pulses controlling the heaters to generate sufficient heat energy to eject ink from the nozzles for printing data, and the non-printing pulses controlling the heaters to generate heat energy that is not sufficient to eject ink from the nozzles for raising a temperature of the ink, Column 2, lines 44 - 53; a temperature sensor for measuring a temperature of the substrate; a temperature comparator for comparing the temperature of the substrate with a reference temperature; and a control circuit for varying the non-printing pulses generated by the signal generator according to a temperature difference of the substrate and the reference temperature, Column 6 (claim 1).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and

invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 12 – 15 and 22 – 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Widder et al. in view of Dunn (U.S. 4,982,199 A).

Widder et al fail to teach the claimed inventions of increasing/decreasing pulse width, amplitude, number of pulses, or frequency of the non-printing pulses in order to vary the temperature of the printhead.

Dunn teaches that if the temperature of the substrate is above the reference temperature, a voltage of the non-printing pulses generated by the signal generator is lowered, and if the temperature of the substrate is below the reference temperature, the voltage of the non-printing pulses generated by the signal generator is raised, Figure 3A; that the control circuit varies a width of the non-printing pulses generated by the signal generator according to a temperature difference between the temperature of the substrate and the reference temperature, wherein if the temperature of the substrate is above the reference temperature, the width of the non-printing pulses generated by the signal generator is lowered, and if the temperature of the substrate is below the reference temperature, the width of the non-printing pulses generated by the signal generator is raised, Figure 3B; that the control circuit varies a number of the non-printing pulses generated by the signal generator according to a temperature difference between the temperature of the substrate and the reference temperature, wherein if the temperature of the substrate is above the reference temperature, the number of the non-printing pulses generated by the signal generator is lowered, and if the temperature of the substrate is below the reference temperature, the number of the non-printing pulses generated by the signal generator is raised; Figure 3C; and that the control circuit varies a frequency of the non-printing pulses generated by the signal generator according to a temperature difference between

the temperature of the substrate and the reference temperature, wherein if the temperature of the substrate is above the reference temperature, the frequency of the non-printing pulses generated by the signal generator is lowered, and if the temperature of the substrate is below the reference temperature, the frequency of the non-printing pulses generated by the signal generator is raised, Figure 3D.

It is well known that the area of a rectangular voltage or current pulse is indicative of the energy delivered to a load: increasing pulse width, amplitude, amount of pulses, and frequency of pulses increases the total area of the non-printing pulses and thereby would increase the temperature of the printhead. Decreasing the width, amplitude, number, or the frequency of the non-printing pulses would delay of lower the heating of the printhead.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the waveforms of Dunn in the printer of Widder et al. in order to control printhead temperature.

Allowable Subject Matter

8. The following is a statement of reasons for the indication of allowable subject matter:

a. The primary reason for the allowance of claims **1** - 10 is the inclusion of the limitations of a printing apparatus comprising a printhead for ejecting ink from a plurality of nozzles; a print data comparator for comparing a percentage of data printed during a predetermined period of time with a threshold value; and a control circuit for varying the non-printing pulses generated by the signal generator according to the percentage of data printed during the predetermined period of time and the threshold value. It is this limitation found in each of the claims, as it is claimed in the combination, that has not been found, taught, or suggested by the prior art of record which makes these claims allowable over the prior art.

b. The primary reason for the allowance of claims **16** - 20 is the inclusion of the method step for heating a printhead in a printing apparatus, by comparing a percentage of data printed during a predetermined period of time with a threshold value; and varying the non-printing pulses according to the percentage of data printed during the predetermined period of time and the threshold value. It is this step found in each of the claims, as it is claimed in the combination, that has not been found, taught, or suggested by the prior art of record which makes these claims allowable over the prior art.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alfred Dudding whose telephone number is (571) 272-2144. The examiner can normally be reached on Monday-Friday from 7:00 AM to 3:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier, AU 2853, can be reached at (571) 272 - 2149. The fax phone number for this Group is are (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the group receptionist whose telephone number is (703) 308 - 0956.

Alfred Dudding
AD
4 January 2005

MANISH SHAH
Primary Examiner